YAKEEN NEET 2.0

2026

Basic Maths and Calculus (Mathematical Tools)

Physics | Homework Solution-03

By- Manish Raj (MR Sir)

30 chapter

12 Topic (Avg)

360 Topic

Question

H/W → PhD. on. H/W मे करना है।

A vertical pole of height $h = 10$ m stands on ground that slopes upwards at a constant angle $\alpha = 30°$ with the horizontal. If the sun's angle of elevation above the horizontal is $\theta = 60°$, what is the length of the shadow cast by the pole on the sloping ground?

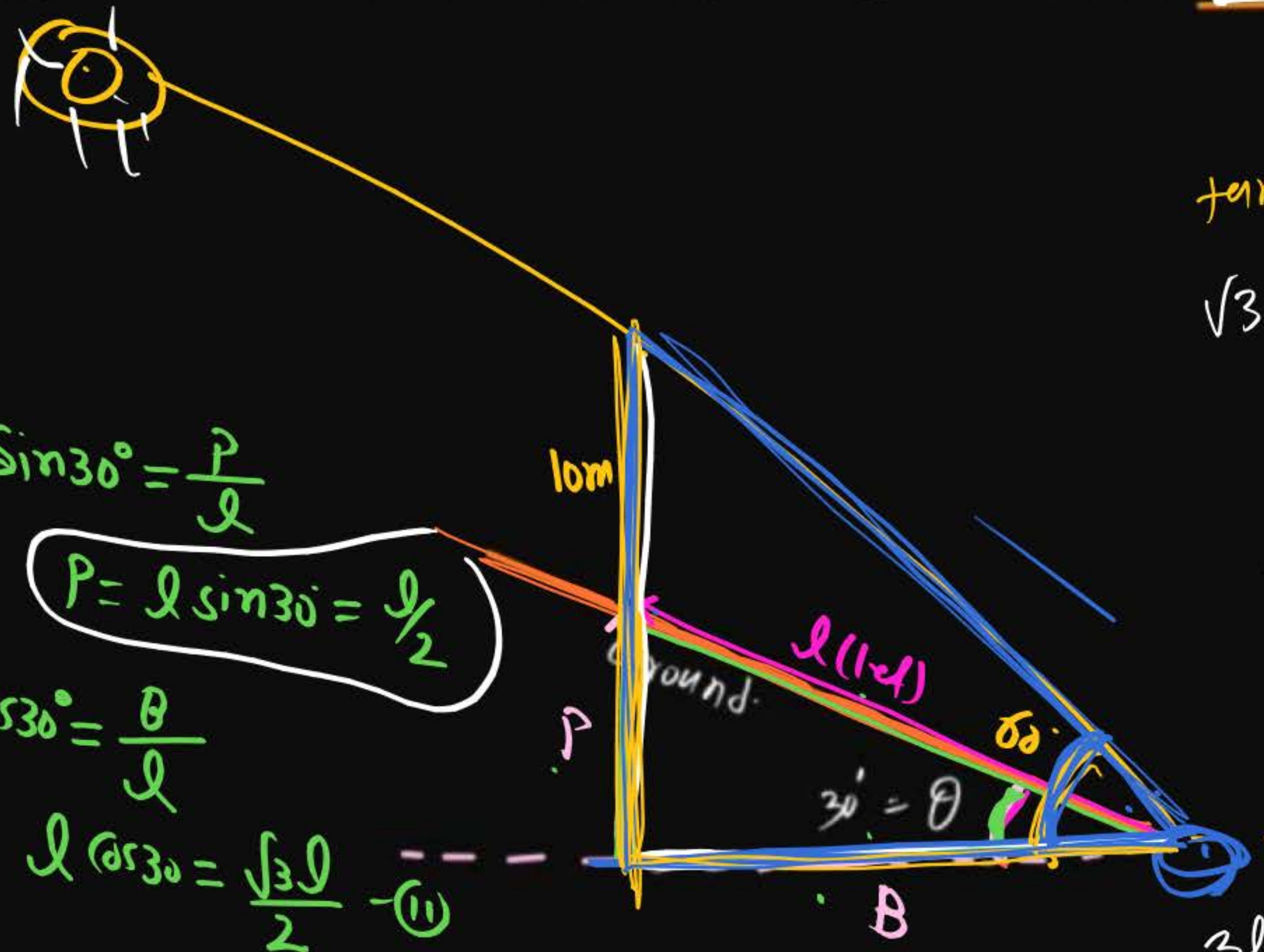
↳ Inclined plane

(1) 5 m

(2) 10 m ✓

(3) $10\sqrt{3}$ m

(4) $\frac{10}{\sqrt{3}-1}$ m



$\sin 30° = \frac{P}{l}$

$\boxed{P = l \sin 30° = l/2}$

$\cos 30° = \frac{B}{l}$

$B = l \cos 30 = \frac{\sqrt{3} l}{2}$ —(ii)

$\tan 60° = \frac{10+P}{B}$

$\sqrt{3} = \frac{10 + \frac{l}{2}}{\frac{\sqrt{3} l}{2}}$

आगे Socho

$\sqrt{3} \times \frac{\sqrt{3} l}{2} = 10 + \frac{l}{2}$

$\frac{3l}{2} = 10 + \frac{l}{2}$

$\frac{3l}{2} - \frac{l}{2} = 10$

$\frac{3l - l}{2} = 10$

$l = 10$

Question

challenge Question (H/W)

$\cos(120) = -\frac{\sqrt{3}}{2} = \frac{-1.71}{2}$

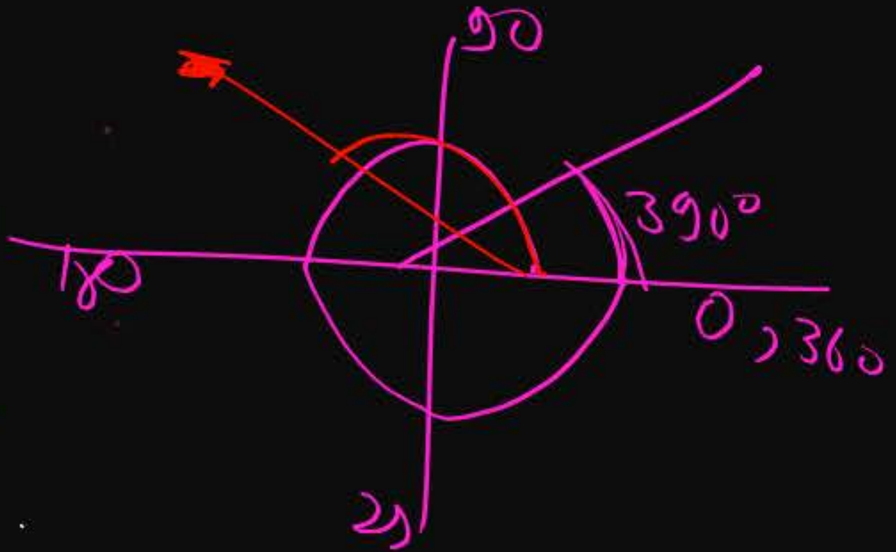
Suggest suitable match between function given in the first column and its description given in the second column.

Column-I	Column-II
(A) sin (390°)	(P) Positive
(B) sin (–30°)	(Q) Negative
(C) cos 120°	(R) Zero
(D) tan (–120°)	(S) Modulus is greater than one
	(T) Modulus is less than one

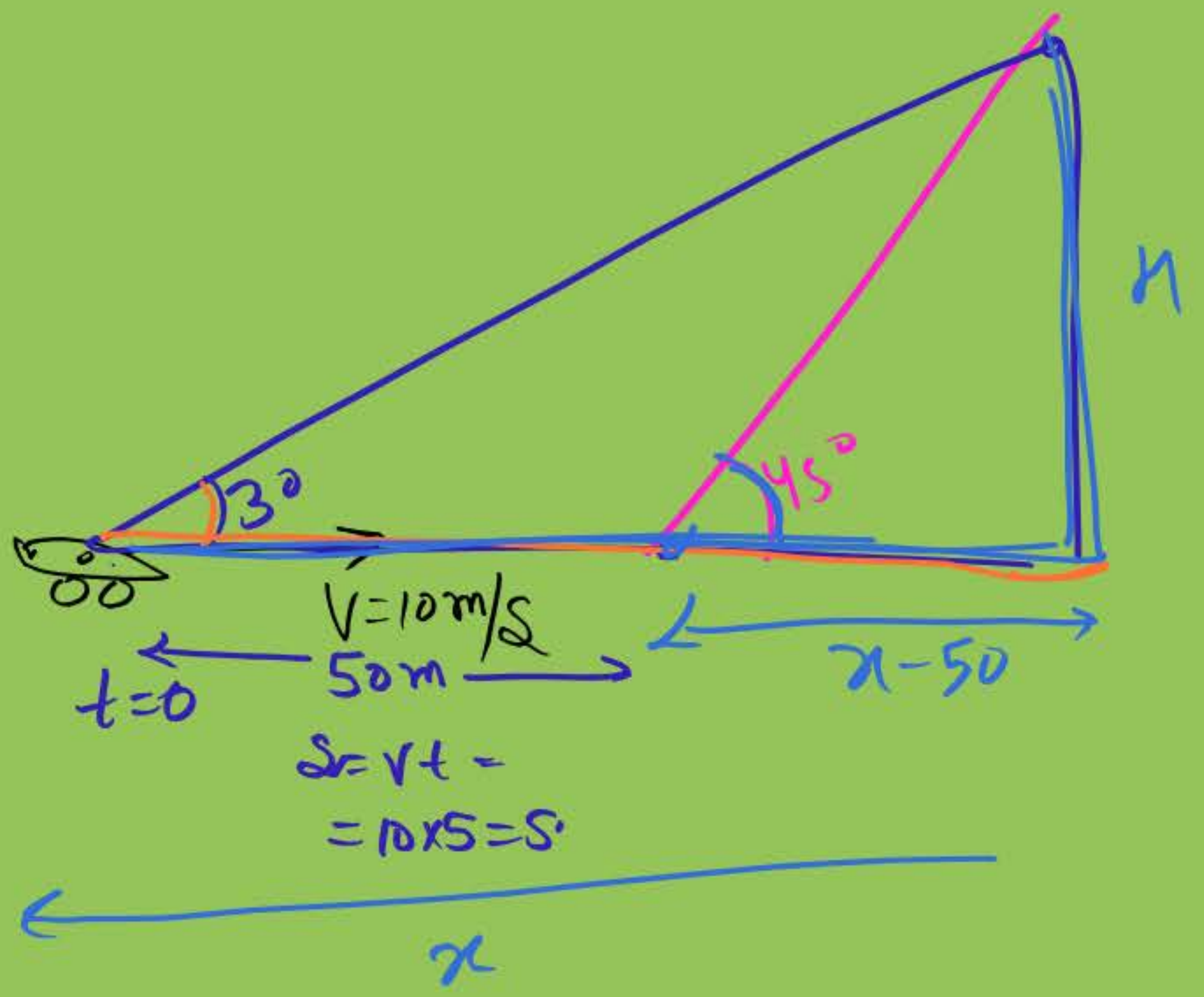
1st

1. A→PT, B →QT, C→QT, D→PS
2. A→PT, B →QS, C→QT, D→PS
3. A→QT, B →QS, C→PT, D→PS
4. A→QS, B →PT, C→QT, D→PS

$\boxed{\sin(-30^\circ) = -\frac{1}{2}}$



$\sin(390^\circ) = \sin(\underbrace{360}_{A} + \underbrace{30}_{B}) = \sin 30^\circ = \left|\frac{1}{2}\right|$



$$\tan 30^\circ = \frac{H}{x}$$

$$\frac{1}{\sqrt{3}} = \frac{H}{x} \quad - (1)$$

$$x = \sqrt{3}H$$

$$\tan 45^\circ = \frac{H}{x-50} = 1$$

$$H = x - 50$$

$$H = \sqrt{3}H - 50$$

$$50 = \sqrt{3}H - H$$

$$50 = H(\sqrt{3}-1) \quad H = \frac{50}{\sqrt{3}-1}$$

Question

Find value:

(i) $\sin 2^\circ = \cancel{2^\circ} = 2\times\frac{\pi\,\text{rad}}{180}$

(ii) $\tan 3^\circ = 3\left(\frac{\pi\,\text{rad}}{18}\right)$

(iii) $\cos 3^\circ = 1$

(iv) $\sin(88.5^\circ) \approx 1$ ✓

Ans

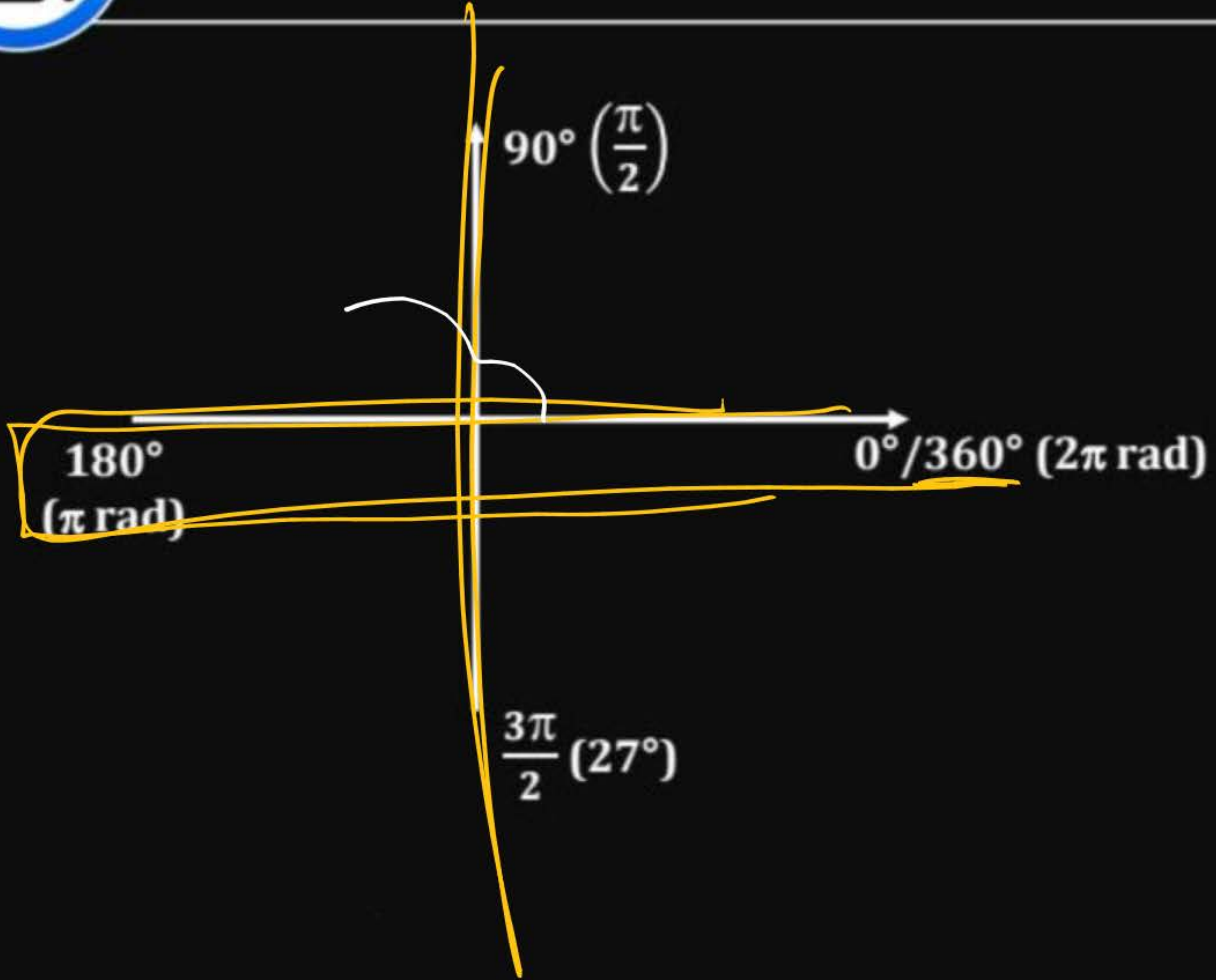
$\cos 0^\circ = 1$

$\cos 1^\circ = 1$

$\cos 2^\circ = 1$

$\cos 3^\circ = 1$

TRIGONOMETRY FUNCTION CHARGE



H/W

$$\boxed{\sin(90^\circ - \theta) = +\cos\theta}$$

$$\cos(90^\circ - \theta) = +\sin\theta$$

$$\sin(90^\circ + \theta) = +\cos\theta$$

$$\cos(90^\circ + \theta) = -\sin\theta$$

$$\sin(180^\circ - \theta) = \sin\theta$$

$$\cos(180^\circ - \theta) = -\cos\theta$$

Question

H/W

Find value of

(i) $\sin(-30°) = -\frac{1}{2}$

(ii) $\cos(-60°) = +\frac{1}{2}$

(iii) $\sin(120°) = \sqrt{3}/2$

(iv) $\sin(390°) = \sin(\underset{A}{360} + \underset{B}{30}) = \sin 30°$ ✓

H/W

$\sin(360°) = 0$

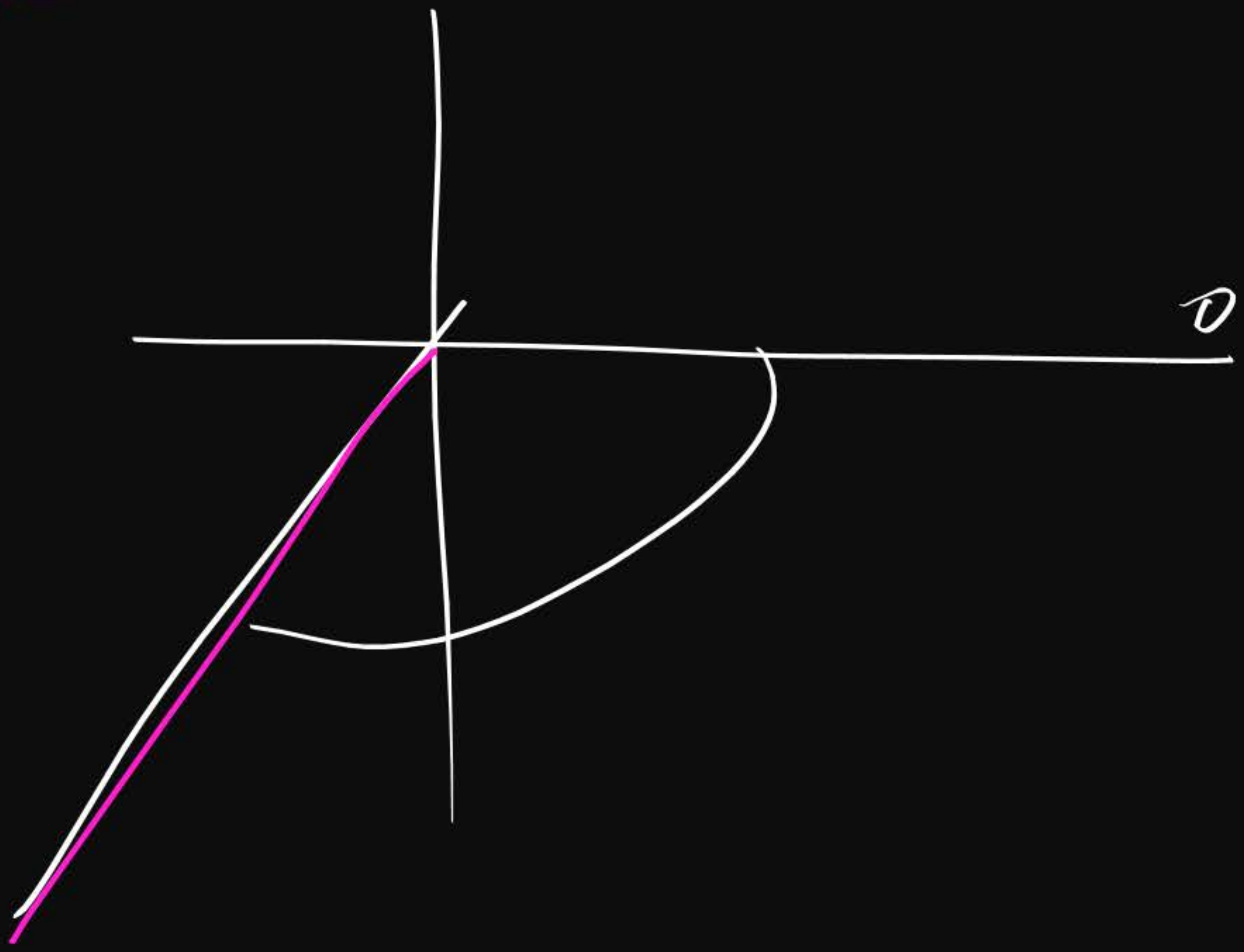
✓ $\sin(450°) = \sin(\underline{\underline{360}}+90) = \sin 90° = 1$

\# $\sin(-90°) = -1$

$\sin(120°) = \sqrt{3}/2$

✓ $\boxed{\sin(-150°) = -\frac{1}{2}}$

$\sin(-\theta) = -\sin\theta$



H/W

$\cos(300°) = \cos(360-60) = +\cos 60° = +\frac{1}{2}$

$= \cancel{\cos 360°}^{1} \cos 60 + \cancel{\sin 360}^{0} \cdot \sin 60$

$= 1 \cos 60 + 0 = \frac{1}{2}$

$=$

$\cos(330°) = \cos(360-30) = \cos 30°$
$= \sqrt{3}/2$

$$\boxed{\tan(240°) = \tan(180+60) = \tan 60 = \sqrt{3}}$$

$\cos(-30°) = \cos(30) = \sqrt{3}/2$

$\tan(-60°) = -\tan 60° = -\sqrt{3}$

$\cot(-45°) = \frac{1}{\tan(-45°)} = \frac{1}{-1} = -1$

Question

H/W

If $y = 3\cos(3\theta)$, then find angle at which y will be zero.

$$\underset{=}{y} = 3\,\underbrace{\cos(3\theta)}_{0}$$

$$3\theta = 90$$

$$\theta = \frac{\cancel{90}}{\cancel{3}} = 30^\circ$$

THANK YOU